

Deflection Basin Parameters (DBPs) for Monitoring Flexible Airport Pavement Structural Deterioration

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ABSTRACT

The National Airport Pavement Test Facility (NAPTF) located at the Federal Aviation Administration (FAA) William J. Hughes Technical Center, Atlantic City International Airport, New Jersey was constructed to generate full-scale testing data to support the investigation of the performance of airport pavements subjected to complex gear loading configurations of new generation aircrafts. At the NAPTF, there are nine pavement (six flexible and three rigid) test items built on three different subgrades: low strength (CBR~3-4), medium strength (CBR~7-9) and high strength (CBR>30). The test pavements were subjected to both B-777 and B-747 traffic. Nondestructive tests (NDTs) with a Falling Weight Deflectometer (FWD) and a Heavy Weight Deflectometer (HWD) were conducted on the trafficked lanes and on the centerline of flexible pavement test items as trafficking progressed. One of the objectives of FWD/HWD testing at NAPTF was to monitor the effect of time and traffic on the structural condition of the pavement. Using the FWD/HWD deflection measurements, Deflection Basin Parameters (DBPs) were derived. The potential for using these DBPs to study the structural degradation in airport flexible pavements was explored. They were also used to compare the severity of B-777 traffic with that of B-747 traffic. Amongst the DBPs studied, the Area Under Pavement Profile (AUPP) and the Impact Stiffness Modulus (ISM) appear to be the best indicators of pavement structural deterioration.